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SOFF
Systematic Observations Financing Facility

SOFF Investment Phase Funding Request of Solomon Islands

Version 2.0

February 2024

Systematic Observations Financing Facility

Weather and climate data for resilience

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SOFF Investment Phase Funding Request

The funding request should be prepared by the SOFF beneficiary country in collaboration with the SOFF implementing entity and supported by the SOFF peer advisor. The funding request reflects and is based on the National Contribution Plan. In case of questions on how to complete this template, please contact the SOFF Secretariat at: soffsecretariat@wmo.int.

The SOFF Investment Funding Request template includes the following sections:

1. **Basic Information**
2. **Programming Criteria**
3. **Readiness and Country Context**
4. **Investment Phase Outputs and Budget**
5. **Investment Phase Implementation Arrangements**
6. **Investment Phase Monitoring, Reporting, and Verification**
7. **Investment Phase Risk Management Framework**

The **GBON Gap Analysis**, the **GBON National Contribution Plan** and **Country Hydromet Diagnostic** are included in **Annex 1, 2, 3**.

The **Terms of References** of the advisory services provided by the **SOFF peer advisor** are provided in **Annex 4.**

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1. Basic Information

SOFF Beneficiary Country and Focal Point	***Solomon Islands*** DocuSigned by: David Hiba Hiriasia 78DE3ADDC0A44C3... *David Hiba Hiriasia, Director, Solomon Islands Meteorological Services and WMO Permanent Representative*			
Country classification	☒ LDC	☒ SIDS	☒ FCS	☒ ODA-recipient
SOFF Implementing Entity and Focal Point	***United Nations Development Programme*** DocuSigned by: Yemesrach Workie 2CF9606A75D94B3... *Ms. Yemesrach Workie, Officer-in-Charge* *Email: yemesrach.workie@undp.org* *United Nations Development Programme, Pacific Office in Fiji*			
SOFF Peer Advisor and Focal Point	***Bureau of Meteorology Australia*** *Dr. Andrew Jones, General Manager International Development* Bureau of Meteorology- Australia			
Total Budget (USD)	Total: **USD 8, 178, 574** (Including budget for Peer Advisor) First tranche: **USD 5, 541, 252** (70% of total budget excluding Peer Advisor's budget) Second tranche: **USD 2, 374, 822** (30% of total budget excluding Peer Advisor's budget)			
Delivery timeframe	July 2024- June 2029			
Date of Steering Committee Approval	*Planned for 21st March 2024*			

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SOFF Steering Committee Co-Chairs Signature (signature confirms Steering Committee approval of the funding request)

2. SOFF Programming Criteria (2 pages)

Alignment with the SOFF Programming Criteria .	
Close the most significant data gaps	***Brief Background*** *The Solomon Islands was selected in 2022 to be a Beneficiary Country of the Systematic Observation Financing Facility. The selection of the Solomon Islands was based on its limited density of surface-based weather observation network to support national, regional and global numerical weather prediction models. In line with the SOFF Programming approach (Decision 3.4), the Bureau of Meteorology Australia was nominated by the Solomon Islands Meteorological Services as the peer advisor and the United Nations Development Programme Office in the Solomon Islands as the Implementing Entity. To initiate the process, a Readiness funding proposal was submitted jointly by SIMS, BOM and UNDP in March 2023 to support the Gap Analysis Process. The Global Basic Observation Network Gap Analysis was undertaken by the Bureau of Meteorology Australia on 19- 23 June 2023 resulting in the National Contribution Plan.* **GBON GAP Analysis:** *The GBON Gap Analysis and National Contribution Plan focused on the following key areas:* • *The current state of weather observations in Solomon Islands highlighting gaps between the existing network and capabilities and the GBON requirements.* • Proposed future state for Solomon Islands weather observation networks to become GBON complaint; and • Details of the activities needed to reach this future state, including the order of magnitude of costing. The Solomon Islands Meteorological Services (SIMS) comprises skilled and motivated teams of observing, technical, forecasting and climate personnel. The teams maintain

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seven weather stations and up to 12 automatic weather stations (AWS) although many of the AWS were no longer operational.

SIMS faces major challenges in skilled and sufficient personnel, logistics, sourcing of equipment and spares, maintenance and data communications. Solomon Islands has no GBON-compliant surface stations and no upper air observations. International sharing of data is limited to seven (7) existing staffed weather stations that report internationally between two (2) to eight (8) times per day. These stations experience quality and reliability issues due to maintenance and calibration challenges and maintenance budget shortfalls.

Based on the above conditions, it is proposed that the minimum number of surface stations required in Solomon Islands to meet GBON requirements is eight (8) surface stations and the minimum number of Upper Air stations is three (3).

Table 1: GBON National Contribution Target

Type of station	Baseline (Results of the GBON National Gap Analysis)				GBON National Contribution Target	
	Target (# of stations) 1	GBON-compliant stations (#)	Gap		To improve	New
			New	To improve		
Surface	7	0	0	7	8	0
Upper air	2	0	2	0	0	3

Principles of GBON Target

As a country of many islands with a very large marine exclusive economic zone (EEZ), developing GBON targets for the Solomon Islands requires some interpretation. The proposed approach and targets for Solomon Islands recognise the following key attributes of the country:

- The Solomons Islands is a seafaring country, and the main mode of transportation is by boat. The waters between islands are the country's critical transport corridors and are analogous to roads or railways in continental countries. For GBON purposes, these areas should be considered similarly to land.
- The Solomon Islands and its marine area are critical zones for cyclogenesis in the Pacific region. Observations in this region, particularly upper air, are critical

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for forecasting cyclones that threaten not just the Solomon Islands but major population centres such as Papua-New Guinea, Indonesia and eastern Australia.

- Topographically, the Solomon Islands is a mixture of steep volcanic ranges rising to over 2000 m above the mean sea level, coral islets, lagoons, and open ocean. Wind flows are strongly influenced by the topography, in addition to diurnal heating. Ideally, the surface synoptic network will observe the main elements of these flows, to allow verification of model downscaling.

Maintaining isolated, unstaffed AWS has historically been less successful in terms of data quality and reliability in Solomon Islands and other SIDS of similar resources. Staffed stations have historically proven to be significantly more reliable, highest quality and most resilient.

GBON Targets

Taking into account the above factors, the approach for calculating targets in Solomon Islands was as follows:

• The area enclosed by the Solomon Islands' 24 nautical mile contiguous zone was taken as an indication of important marine transport corridors. This area was combined with the land area to give an indicative overall 'land and major marine corridor' area of about 360,000 km2.

• For surface stations, this area was used with the low density land-based GBON target of 200 km resolution, giving a corresponding GBON target of nine (9) surface stations. This was modified to eight (8) stations following feedback from the WMO technical authority on the station density that could be supported from a GBON perspective.

• For upper air stations, the GBON land-based resolution requirement of 500 km was used. As Solomon Islands is elongate in the east-west direction, to ensure adequate coverage across the east-west transect, grid cells of 500 x 500 km were arranged so as to cover most of the major 'land and major marine corridors' area (Figure 1). This resulted in a target of 3 upper air stations, with one to be located in each grid cell.

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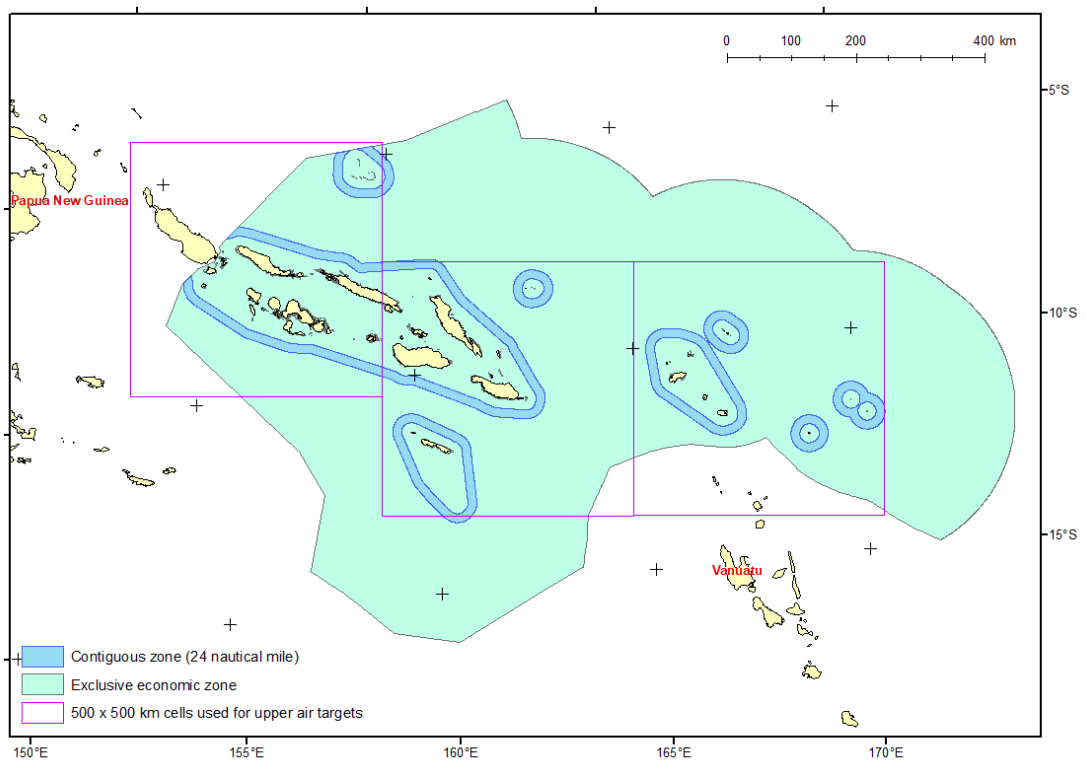

Figure 1: Map showing Solomon Islands 24 nautical mile contiguous zone and 500 x 500 km gridcells used to define upper air station target.

The resulting targets highlighted by the GBON National Contribution Plan to be implemented include:

- . **Surface stations**:
    - Eight (8) stations, comprising staffed stations with co-located AWS will be improved to GBON standard or installed as new, including:
        - Seven existing staffed stations in Taro, Munda, Auki, Honiara, Henderson Airport, Rennnell/Tingoa and Santa Cruz/Lata
        - One closed staffed station at Kira Kira

While eight new stations are proposed to be co- located with staff stations, the cost of installation will be same as setting up a new station. This is mainly driven by high cost of living and logistics to reach the remote areas.

- **Upper air stations**
    - Three new upper air stations will be established as GBON upper air stations, co-located with GBON surface stations. These will be located at:
        - Tulagi, in the central part of the country in Central Province
        - Taro, in the west in Choiseul Province
        - Santa Cruz/Lata in the east in Temotu Province

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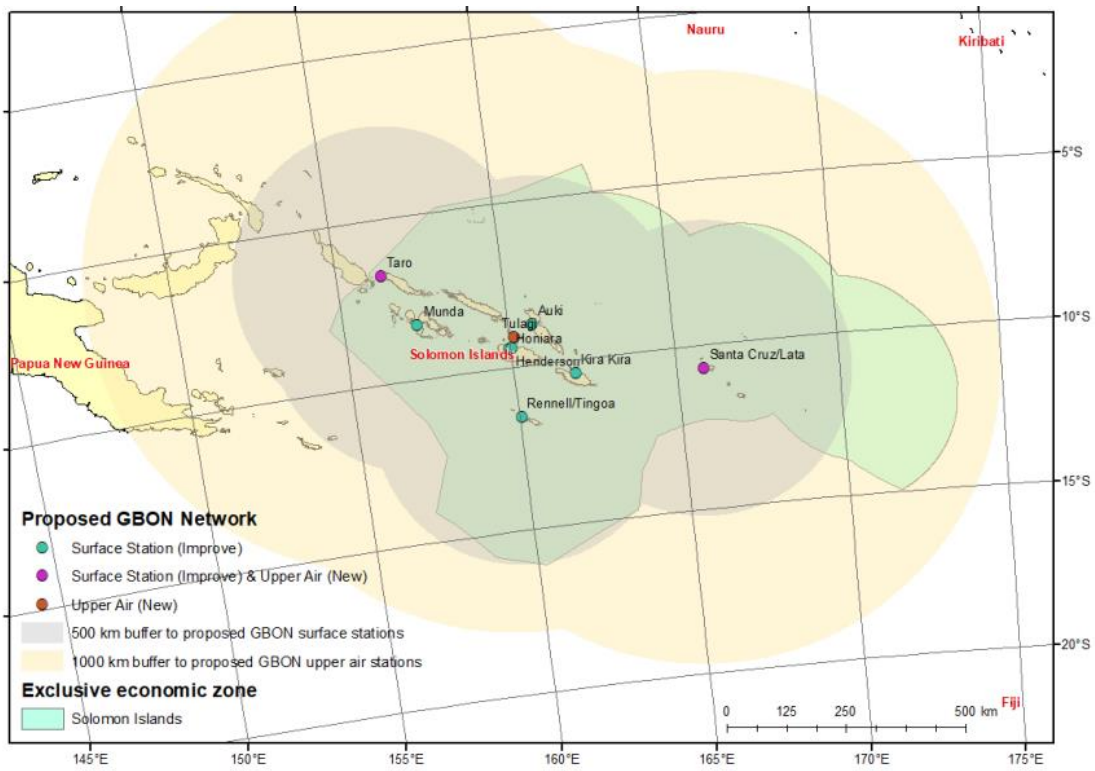

Figure 2: Map of proposed surface and upper- air stations for GBON

In addition to procurement of equipment, infrastructure and upgrading of stations, the GBON National Contribution Plan for Solomon Islands has also identified the need for a significant upgrade to SIMS's ICT and data management systems to achieve sustainable, reliable reporting to WIS at the required frequencies. SIMS will retain total control and custodianship over their data. The GBON National Contribution Plan highlighted that the data storage solution for the upper air radiosonde data will be developed as part of the procurement of the upper air equipment, also using cloud-based system.

Human resource capacity development recommended by the National GBON Contribution Plan identified training of SIMS observing staff (Met Technicians) in basic surface and upper station maintenance and training of technical staff (Maintenance Engineers) in comprehensive surface and upper air station maintenance as necessary capacity development components for SIMS human resources.

With the implementation of the GBON National Contribution Plan, the Solomon Islands is anticipated to fully comply with the GBON requirements. No exemption to the GBON requirements will therefore be required for Solomon Islands.,

Target easy fixes	For easy fixes it is proposed that existing AWS will be audited to identify those that are serviceable or repairable and uplift their communications and IT systems to ensure these stations report internationally via the new Meteorological Data Management

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System described below. It is anticipated that approximately eight of the existing stations will be uplifted to report internationally based on the findings of the audit.

The Bureau of Meteorology is also prepared to upgrade the data transmission algorithms and systems for the existing three sea level stations such that they report internationally. This can be done concurrently with the SOFF investment. These stations can be designated marine GBON stations for the variable sea level pressure.

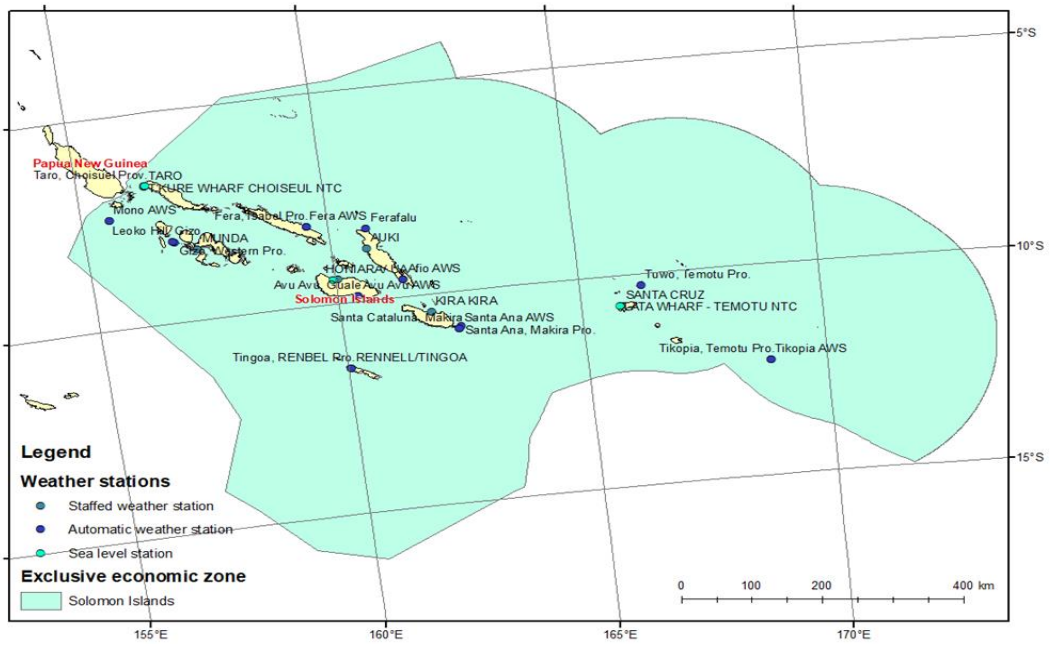

Figure 3: Existing Weather Stations in Solomon Islands

Target state and recommended activities

Surface Stations

The plan for GBON surface stations in the Solomon Islands is to co-locate staffed weather stations with an AWS. The approach is proposed for the following reasons:

- Co-locating the AWS with the staffed stations will enable the stations to provide 24 hours observations.
- Maintenance of unattended AWS to GBON reliability standards is challenging in Solomon Islands due to major logistical challenges (lack of roads, requirement for boat access, harsh environmental conditions, etc.). Having staff on-hand to performance basic maintenance is essential to ensure sufficient up-time to meet GBON standards.
- Having both manual and automatic observations will provide redundancy for down- time of the AWS equipment (e.g. due to delays in shipping parts).

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When the AWS is down, the frequency of manual observations can be temporarily increased to hourly.

- The presence of skilled staff on-site will provide quality control and allow for quick, reactive basic maintenance in the event of equipment problems.
- Staff on-site will be able to provide security and grounds maintenance (e.g. vegetation mowing) to ensure the site complies with WMO siting requirements.

ICT infrastructure and services & Data Management

Weather data transmission is challenged by reliability of cellular- based internet services at some field stations resulting in significant delays in email transmission up to several hours. Regular power failure and load shedding at the SIMS head office in Honiara cause significant delays in receipt and transmission. The current data management system of SIMS is not consolidated in one server. Access depends on the AWS type and location of the server.

SIMS maintains a local version of the Climate Data for Environment (CliDE) database that is hosted by the Climate Section of SIMS and located at the Rove Outback office in Honiara. CliDE provides storage, basic visualization and extraction tools for weather and climate data. On the other hand, data transmitted by OTT- Hydromet AWS can only be accessed by field staff at the Vavaya Ridge Office in Honiara however Forecasters in the Vavaya Ridge office cannot access both databases. Forecasters can view recent observations as part of forecasting preparations from the NIWA's New Zealand server via NIWAs Neon web tool. Public access to daily weather reports is through SIMS webpage with limited international audience however observations from SIMS AWS or field stations are not accessible to other stakeholders or public. None of the AWS data are transmitted to GTS/ WIS.

The sea level monitoring stations send data via BGAN satellite back to Bureau servers in Australia, where it is stored and made available on the Bureau webpage. Sea level data are transmitted to the GTS but other weather variables are currently not supplied internationally.

Based on the above, the GBON National Contribution Plan identified that achieving sustainable, reliable reporting to WIS at hourly frequencies from all eight (8) proposed GBON surface station will require a significant upgrade to SIMS ICT data management systems including implementing a new Meteorological Data Management System (MDMS). Cloud-based system is recommended to mitigate regular power interruptions.

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	Target state and activities Achieving sustainable, reliable reporting to WIS at hourly frequencies from all 8 proposed GBON surface stations will require a significant upgrade to the SIMS ICT and data management systems including implementing a new Meteorological Data Management System (MDMS). Given the lack of reliable power supply, it is likely that a cloud-based solution will be most suitable. At the start of the investment phase, an audit of existing power supply, ICT equipment and data flows will be undertaken to establish the detailed architecture of a Meteorological Data Management System (MDMS) compliant with WIS 2.0. The MDMS must not be a single point of failure. This must be avoided with redundancy of the MDMS hardware, network connections and processing workflows or by deploying the MDMS on cloud-based services with the required level of resilience. Key anticipated elements of the data system are described at conceptual level below. • **Observing station data collection** As part of the upgrade of manual and automatic weather stations, all stations will be equipped with robust cellular or satellite (preferred) communications to ensure regular, timely message transmission. Redundant data communications (satellite & cellular) communications from all sites are recommended. AWS will be configured to send data to the MDMS via a suitable data transfer protocol (e.g. MQTT or SFTP). The MDMS should have the ability for observers to supply manual observations via e-mail in the existing SYNOP or METAR/SPEC format, as well as through more modern methods such as a web or mobile-accessible interface. • **Data transmission to WIS 2.0** The MDMS will have the capability to undertake basic automated QC, then convert the data received from both automatic and manual stations to BUFR format before making the data available to WIS 2.0 through an HTTP service. • **Data services** The MDMS will also provide data services (e.g. APIs, shared filesystem, publication/ subscription service) to enable SIMS to access the data, use it operationally and make it available to stakeholders. • **Climate data management** A Climate Data Management System (CDMS) will access data from the MDMS. The CDMS could be an updated and potentially cloud-based version of CliDE, or another suitable system selected in the procurement process. The CDMS should be compliant with WMO No. 1131 Climate Data Management Systems. The CDMS will be used to store, view and extract all climate data and metadata collected by SIMS. Appropriate

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	processing to produce quality-controlled data and statistics for climate purposes will be performed in the CDMS. • **Webpage** A public-facing webpage will also be developed to disseminate key meteorological and climate data to other Solomon Islands stakeholders and the public. Consultation with stakeholders such as the Water Resources Division, the Maritime Safety Authority and the Disaster National Operations Centre, highlighted a strong demand for weather observations for situational awareness. Given the maritime nature of the country, there is also strong public interest. Disseminating the data widely under SIMS banner will increase public and government support for the important work done by SIMS to collect and steward these data, supported by SOFF. Through the entire value chain of data collection, transmission, processing, storage and distribution, SIMS will retain total control and custodianship over their data. Activities to upgrade data systems as described above are: • Procure expert audit of power supply, ICT equipment and data flows at start of Investment Phase, to develop detailed architecture for the Meteorological Data Management System and WIS 2.0 implementation. • Procure, install and commission a Meteorological Data Management System (including WIS 2.0 capability) through a 'supply and support' contracting approach, including ongoing training and maintenance support. • Procure, install and commission a suitable upgraded Climate Data Management System through a 'supply and support' contracting approach. • Develop a webpage to provide weather data products to stakeholders and the public.
Create leverage	The SOFF Investment program will build on and complement previous, current and planned efforts by UNDP, the development partners, regionally based organizations, and Civil Society Organizations to strengthen early warning, weather observations and forecasting. Ongoing government initiatives to enhance weather and climate services include the implementation of the National Strategy for Meteorological Services and Framework for Climate and Ocean Services 2023- 2028. This also includes the support from bilateral and multilateral partners. The Australian Bureau of Meteorology continued to provide institutional and technical support to the Solomon Island Meteorological Service long before the enactment of the Meteorology Act in 1985. This working relationship is maintained to date through initiatives such as the Climate and Ocean Support Program in the Pacific (COSPPac)

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	and Australian Government Funded project. CosPPac provides ongoing capacity development to SIMS and will complement SOFF in upgrading the data algorithms from the three sea level monitoring stations. At the Pacific regional level, the Weather Ready Program, a multi- donor decadal initiative to strengthen full hydro- meteorological system across the whole value chain in the Pacific Region will provide coordination platform for investments in meteorological infrastructure and training. Weather Ready Pacific can leverage the improved observations from SOFF investment as part of its broader focus on hydrometeorological services. UNDP Multi- Country Office in Fiji supported climate information and early warning systems in 14 different Pacific Island Countries including Solomon Islands. Similarly, UNDP country presence have been working closely with the MECDM including SIMS through four main climate change projects since the early 2000s. The project "**Enhancing resilience of communities in Solomon Islands to the adverse effects of climate change in agriculture and food security (2011- 2015)** funded by the Adaptation Fund supplied six AWS and Automatic Rain Gauges for agriculture purposes. The **"Solomon Islands Water Sector Adaptation Project (2014- 2018**) funded by the Global Environmental Facility fifth cycle under LDCF installed about six Hydromet stations to support water resource management in targeted areas. Most of those stations are no longer functioning and need to be replaced particularly in strategic locations such as Mono along the PNG/ Solomon Islands border. The most recent UNDP support to SIMS is through the Integrated Disaster Risk Management Project (IDRM) funded by the Australian Government (2021- 2023) which supported the installation of the four AWS and an Automatic Weather Observation Station at Henderson International Airport in Honiara city, the acquisition of server equipment for data storage, capacity building of the engineering team on managing data from the hydrometeorological stations, and the construction of the National Weather Forecasting Office to accommodate a 24 hour weather observation and early warning services. CREWS 2.0 Pacific: A collaboration between WMO, World Bank and UNDRR will build on its past efforts with SIMS on Impact based Forecasting to prioritize community engagement. Stimulating Progress towards Improved Rural Electrification in Solomon Islands (SPIRES). A GEF funded project that is currently piloting establishment of mini solar grids in off- grid rural areas. Lessons from SPIRES can inform alternative electricity supply for SOFF infrastructure in remote locations. International NGOs such as Oxfam, Save the Children and World Vision has been working very closely with the SIMS to support community-level impact-based forecasting activities and other outreach programs over the last decade.

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	Save The Children Australia has recently received USD 25 million from the Green Climate Fund (GCF) to support Climate Change Knowledge, Action and Sustainability in 185 communities Solomon Islands of which the application of weather and climate data in various social sectors at the community level is the key focus. There are ongoing discussions between SIMS and Save the Children Australia to complement SOFF funded activities. Additionally, the SOFF will make a significant contribution toward the National Strategy for Meteorological Services and Framework for Weather Climate and Ocean Services 2023- 2028.
Maximize delivery capacity	UNDP's IDRM project currently has five staff at the Project Management Unit consisting of two international staff three national staff and a national consultant civil engineer who has been working closely with SIMS on the construction of the National Weather Forecasting office, the AWS installations and capacity building over the past three years. For both SOFF Investment and Compliance phases, UNDP will work closely with SIMS and the BOM Australia to develop strategies and plans for the complex procurements that is informed by sound market research. UNDP will conduct the Harmonized Approach to Cash Transfer Assessment (HACT) for MECDM which is the mother ministry of SIMS as a prerequisite for providing grants. A Letter of Agreement will be signed between UNDP and MECDM on behalf of SIMS for provision of periodic grants to SIMS to support logistics and transportation of staff to conduct routine field visits. The Ministry of Finance and Treasure will be consulted on the relevant financial mechanism for transferring of the grants to SIMS. In country partners such as the World Bank Road and Infrastructure Project and the Australian Government funded Solomon Islands Infrastructure Programme (SIIP) will be consulted for knowledge sharing on procurement and construction. The project team is supported by a strong procurement team within the UNDP Solomon Islands Office with local knowledge of the challenges of logistical routes and available support in remote areas to move supplies and construction materials. SIMS and UNDP have worked together in procurement, transportation and construction of AWS in remote areas of the country and will rely on those experiences for SOFF. Standard designs for mounting of AWS and perimeter fencing will be revisited and upgraded to suit the GBON standards. The Fiji Multi- Country Office and the Asia/ Pacific Regional Hub in Bangkok will provide compliance checks for procurement values above USD 250, 000. Ongoing liaison, knowledge sharing and coordination with regional organizations such as SPC and SPREP will be explored at the commencement of the SOFF investment phase and will continue into the compliance phase.

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	In terms of sustainability, UNDP is able to leverage its other projects within the area of Climate Change and Disaster Risk Management to support components not directly covered by SOFF and to do further resource mobilization on behalf of SIMS through locally available donor funding or other global financing mechanisms. UNDP is exploring possibility for additional climate and innovative financing to undertake area-based approach to programming targeting locations for the Upper Stations particularly in Choiseul and Temotu provinces. This would assist with reducing operational and human resources costs for UNDP specified in the SOFF budget. The SOFF initiative will enhance the quality of the ongoing climate, early warning and disaster risk management initiatives through the availability of reliable data and technical capacity.
Sub-regional gains	Coordination was undertaken with peer advisors for neighbouring countries during development of the National Contribution Plan. The proposed station layout, especially for upper air, takes into account other regional SOFF activities. The proposed stations will contribute to a broader well-distributed multi-country network across a critical region for cyclogenesis encompassing other SOFF-funded stations in nearby countries including Papua New Guinea, Fiji, Nauru and Vanuatu. The National Contribution Plan has also been structured to be flexible to accommodate future regional coordination initiatives such as regionally focused equipment calibration services, training, procurement of common equipment types, and maintenance services. These will be pursued through several forums in which SIMS is active participant including: • Regional SOFF coordination workshop in April 2024 • WMO Regional Association V committee • Pacific Meteorological Council and its committees • South Pacific Regional Environmental Programme • Pacific Community. The SOFF investment will also be complementary with the Weather Ready Pacific Program, which aims to comprehensively strengthen the full hydro-meteorological system across the whole value chain in the Pacific region. Weather Ready Pacific can leverage the improved observations from SOFF investment as part of its broader focus on hydro-meteorological services. During the Investment Phase, SIMS, UNDP and BOM will also pursue opportunities for regional synergies for maintenance services that can be implemented during the Compliance Phase, such as coordinated procurement of spare parts and calibration services. The SOFF Investment Phase will support potential regional training initiatives in specialized maintenance and repair; instrument calibration and train the trainer services.

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3. Readiness and Country context (1 page)

SOFF Beneficiary Country Capacity Assessment

The Solomon Islands Meteorological Services (SIMS) is a division within the Ministry of Environment Climate Change Disaster Management and Meteorology (MECDM). SIMS was established by Meteorology Act in 1985. Headed by the Director, SIMS has approximately 62 staff members distributed across four units comprising Forecasting, Operations, Climatology and Technical and supported by a team of ancillary staff. Of the professional staff, 92% are male and 8% are female making the recruitment of additional female staff and awareness on gender equality and social inclusion a critical component of SOFF Investment Phase to deliver as well. The Operations Unit has the highest number of staff comprising observers in Honiara and across provinces.

The staff members under the Technical Unit headed by the Chief Technical Officer are responsible for the installation of AWSs, AWOS and ARG around the country and have worked with past and present projects to install, configure and maintain the equipment. This team includes skilled technicians including an IT specialist, electronics engineer, and an observer expert trained at BOM, Australia. The Operations (Observing) team headed by the Chief Meteorological Officer (CMO) currently has 27 personnel trained in manual weather observations based at the seven (7) field stations across the country. The CMO is currently recruiting an additional seven (7) personnel for the observations team to allow full complement of shifts across all SIMS staffed stations.

Finance and administrative duties for SIMS are performed by the corporate division of the Ministry of Environment Climate Change Disaster Management and Meteorology. With annual budget of USD 500, 000, all SIMS financial and procurement are done by the main ministry, MECDM in accordance with the Financial Management Act and regulations of the Solomon Islands Government.

UNDP and SIMS will immediately at the commencement of SOFF Investment phase will commence the necessary discussions and process confirm the most appropriate financial mechanism in accordance with the Financial Management Act and regulations as well as UNDP HACT Policy. A Letter of Agreement will be signed between UNDP and SIMS for periodic grants to be made available to SIMS. The funds will allow flexibility for SIMS to conduct routine maintenance of AWS around the country. The process once established will also allow funds to be transferred from the WMO to SIMS to implement targeted activities for the Compliance phase.

The SIMS has a highly motivated and well-trained team who are able to implement SOFF Investment Plan to reach GBON requirements however require additional capacity development. The GBON National Contribution Plan identified that SIMS has no specific ICT personnel. Further ICT capacity building is required by SIMS to maintain data and communications system including HTTP, MOTT, APIs and WIS2.0 data exchange systems. To sustain the GBON compliance, the following trainings are required:

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- Basic automatic and manual weather station verification and maintenance at the start of the Investment Phase for SIMS Observer and ongoing training through Compliance Phase.
- Comprehensive training weather station maintenance for all technical staff at the start and throughout the compliance phase.
- Cellular and satellite communications and router configuration during the investment phase for all SIMS technical and engineering personnel.
- Regional support for trainings of observing staff leading to BIT-MT qualifications can be provided with support of SOFF. Selected members of Operations and technical team will be provided with training in OSCAR/ Surface and WDQMS operation.

The GBON National Contribution Plan recommends the recruitment of additional staff for the following:

- Observers to operate Kirakira staffed station and the new upper air stations at Tulagi, Taro and Lata.
- Recruitment of one new ICT professional, skilled in network, database and communications technology critical to WIS2.0, MDMS and CDMS for Investment and Compliance phases.
- At the senior management level, provide a SOFF funded programme/ project manager to oversee equipment procurement, installation and commissioning during the investment phase with the position to ideally continue for the life of the equipment during the Compliance funded with SOFF compliance funding.

Investment Phase Alignment with the GBON National Contribution Plan

Like many other Pacific States and SIDS, Solomon Islands is also geographically dispersed comprising, long standing socio-economic tensions, vulnerability to natural hazards including climate change, infrastructure gaps and weak institutions. High global prices have translated into rising cost of living in Solomon Islands. The recent UN cost of Living Survey conducted in 2023 indicated that prices of goods and services are 62.1% relative to that of New York due to exchange rate fluctuation and local inflation.

This is the main consideration in estimating budgets for installation of new AWS and construction of the three upper air stations. It must also be noted that Solomon Islands is one of those places in the world with highest number of unexploded ordinance (UXO) per capita from World War II scattered all over the country which also has an implication on cost of civil works. Lessons from installing past AWS in remote locations in Solomon by UNDP and World Bank were taken into consideration in estimating the budget. Experience of the Bureau in construction of new upper air station in remote locations in PNG were compared with the World Bank pricing to estimate the budgets for surface and upper air stations in the three proposed locations.

DocuSign Envelope ID: B36D93F9-1AA2-48B5-937A-67E89D31044C

The cost under output 2 includes procurement and delivery of items to the capital city as well as costs of all other corresponding activities to ensure GBON infrastructures are in place and operational within the context for Solomon Islands which include:

- Storage, consolidation and shipment of equipment and construction materials from the capital city Honiara to selected locations;
- Design, Engineering Peer- Review, site preparations, natural hazards risk assessments and UXO clearance to ensure resilient GBON infrastructure;
- Perimeter fencing and security of equipment as well as at site;
- Site- specific Environment Impact Assessment and Environment and Social Management Plan to minimize the environmental and social risks associated with implementation of GBON Infrastructure at targeted locations.
- Standard Operating Procedures (SOP) for operating the equipment, training of staff on operation of equipment and quick repair; and
- Alternative power supply and communications set up for surface and upper air stations. .

The Investment Phase targets are consistent with the final signed version of the GBON National Contribution Plan.

DocuSign Envelope ID: B36D93F9-1AA2-48B5-937A-67E89D31044C

4. Investment Phase Outputs and Budget

The GBON National Contribution Plan provides detailed information on the Investment Phase Outputs (please see Annex 1).

Based on the recommendations and technical specifications provided in the National GBON Gap Analysis and GBON National Contribution Plan, and complemented by the Country Hydromet Diagnostic, please provide the required budget amount for the delivery of the Investment Phase Outputs.

Output 1. GBON institutional and human capacity developed	Main activities	Budget (USD)
1.1 **National consultations** including with CSOs, and other relevant stakeholders conducted	1.1.1 Inception workshops at the national and sub-national level targeting different stakeholders. 1.1.2. Stakeholder engagement workshops on implementation of SOFF 1.1.3. Development of an engagement and implementation Plan	85, 000
1.2 **NMHS institutional capacity** required to operate the GBON network developed	1.2.1. Strengthening of existing institutional arrangements to maximize SOFF initiative and leveraging existing subregional arrangements. 1.2.2. Development of Gender Gap Analysis and Gender Action Plan for mainstreaming Gender into SOFF initiatives. 1.2.3. Partnership Strengthening with CSOs and Private Sector 1.2.4. Development of MoUs and agreements with relevant stakeholders 1.2.5. Participation at regional coordination platforms on SOFF	315, 000
1.3 **NMHS human capacity** required to operate the GBON network developed	1.3.1. Training of existing SIMS staff on the operation of new equipment including BIP- MT Training, ICT & Comms Training 1.3.2. Recruitment of new staff & internship program for SIMS to increase staff numbers to support additional capability. 1.3.3. Staff participation in exchange programs with peer advisor & other SIDS Met Services participating in SOFF.	1, 305, 000

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	1.3.4 Staff (Project Management Unit) required to successfully facilitate SOFF procurement, project compliance requirements, monitoring, reporting, coordination etc,	
Output 2. GBON infrastructure in place	**Main activities**	**Budget (USD)**
2.1 **New land-based** stations and related equipment, ICT systems, data management systems and standard operating practices in place		
2.2 **Improved land-based** stations and related equipment, ICT systems, data management systems and standard operating practices in place	2.2.1. Secure land access for opening of KiraKira 2.2.2. Undertake audit of existing manual equipment and facilities at staffed stations to identify materials for procurement. 2.2.3. Procure 7 x uplifted manual observing equipment and 1 new manual station. 2.2.4 Procure 8 new AWS to co-locate with manned stations including transportation to targeted sites, site works, structures, facilities, power and communications infrastructure. 2.2.5 Travel of staff to oversee installation of new equipment. 2.2.6. Procure expert audit of power supply, ICT equipment and data flow at start of investment phase to develop detailed architecture for Meteorological Data Management System and WIS 2.0 implementation. 2.2.7. Procure install and commission a Meteorological Data Management System (including WIS 2.0 capability) including training and maintenance support. 2. 2.8. Procure, install and commission suitable upgraded Climate Data Management System 2.2.9. Develop webpage to provide weather data products to stakeholders and public.	1,407, 000
2.3 **New upper-air** stations and related equipment, ICT systems, data management systems and standard operating practices in place	2.3.1. Secure Land, Feasibility, EIA, Design, Peer- review Engineer, Tendering Construction, Contract Management for three (3) Upper Air Station as per GBON NCP (Tulagi, Lata & Taro)	3, 460, 000

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	2.3.2. Engagement of proper telecommunications system to enable data flow from Upper-Air Stations to SIMS. 2.3.3. Travel of staff to monitor and participate in construction of Upper Air Stations.	
Outcome: Sustained compliance with GBON	**Main activities**	**Budget (USD)**
3.1 **GBON land-based stations' commissioning period completed**, country-specific standard cost for operations and maintenance established, and data sharing verified by WMO Technical Authority	3.1.1. Procurement of equipment, supplies and materials to maintain consistent operation of land-based stations after commissioning. 3.1.2. Travel of staff to conduct routine and emergency maintenance on land-based equipment.	226, 200
3.2 **GBON upper air stations' commissioning period completed**, country-specific standard cost for operations and maintenance established, and data sharing verified by WMO Technical Authority	**3.2.1.** Procurement of equipment, supplies and materials to maintain consistent operation of land-based stations after commissioning. 3.2.2. Travel of staff to conduct routine and emergency maintenance on Upper- Air Stations.	600, 000
Total for all Outputs		**7, 398, 200**
Implementing Entity Fee[1]		**517, 874**
SOFF peer advisory services		**262, 500**
Total funding request		**8, 178, 574**

[1] The implementation fee cannot exceed 7% of the total Investment Phase funding request.

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Budget breakdown by UNDG category (Excluding SOFF peer advisory services)[2]	**USD**
Staff and personnel costs	**1, 190, 000**
Supplies, Commodities and Materials	**726, 200**
Equipment, Vehicles, Furniture and Depreciation	**4, 020, 000**
Contractual Services Expenses	**434, 250**
Travel	**660, 750**
Transfers and Grants	**287, 000**
General Operating Costs	**597, 874**

[2] The total budget (excluding the budget for the SOFF peer advisory services) is expected to be disaggregated by UNDG category. It includes direct and indirect costs of the Implementing Entity and beneficiary countries to establish a fully operational observation network, collecting and internationally exchanging data according to GBON requirements. Eligible expenditures are any type of expenditure required to implement the GBON National Contribution Plan, including the requirements of the beneficiary country to manage and administer the day-to-day activities of the Investment Phase. It also includes the budget required for the operation and maintenance of the observing network.

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5. Investment Phase Implementation Arrangements

Execution model and implementation arrangements	**Implementation Model** The SOFF Investment Program comprises capacity building, recruitment additional human resources, complex procurement of equipment, civil works and specialized services to meet GBON requirements. To deliver such services, the MECDM has agreed that **Direct Implementation Model (DIM)** is required supported by strong Project Management Unit. This means that all complex procurement will be managed by UNDP during the Investment Phase to avoid the delay often faced by the government process for overseas procurement. UNDP's Project Formulation Process requires development of the full procurement plan prior to project approval. UNDP will consult with SIMS and BOM Australia to develop a consolidated procurement plan for all categories of items specified in the National Contribution Plan for the Investment and Compliance Phases. The Ministry of Finance and Treasure engaged at the commencement of the project implementation to determine the transition of procurement responsibilities from UNDP to MECDM/ SIMS to support the compliance phase. During project implementation, procurement strategies will be developed in consultation with BOM, SIMS and other relevant partners for each item to determine the best solicitation method, negotiation requirements and conditions of contracting. For civil works and construction, UNDP will also engage a competent international engineering firm to provide peer-review and quality assurance role on structural components. This be done in accordance with local legislations and there building codes. UNDP will also liaise with UNEP, WMO, SPC and SPREP for coordination and information sharing purposes on procurement of items and for standardization of materials. PMU will need to frontload major procurement items during the first 18 months of project implementation to meet the Investment Phase timeframe. The PMU will, within the first year of implementation, initiate a micro assessment under the Harmonized Approach to Cash Transfer (HACT) Framework to identify and develop an assurance plan to strengthen the financial management and procurement systems of MECDM/ SIMS to meet the requirements of MPTF and SOFF. This will allow the establishment of processes with the aim of gradually transferring the administrative and procurement functions of SOFF to SIMS supported by grants for operational costs of SIMS.

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	Governance Arrangement A project board will be established to provide oversight role of the project once developed to achieve the SOFF National Contribution Plan. The composition of the board is not limited to MECDM, UNDP, SIMS and BOM Australia however all four mentioned organizations will be responsible for making decisions by consensus, guided and advised by the Project Manager and implementing partners. The PMU will work closely with SIMS and BOM Australia to develop annual work plans for the approval of the project board prior to the commencement of implementation. The project board is required to hold meetings biennially during which Annual Work Plans and Budget as well as progress update is provided by PMU including recommendations for endorsement based on the actual implementation. The Senior Supplier (UNDP) and the Senior Beneficiary (MECDM) will form the Executive of the Project Board while SIMS will be regarded as the Senior Beneficiary. BOM will provide quality assurance on the technical components while UNDP's Resilience and Climate Portfolio will provide quality assurance from the programme/ project management perspective. A generic governance arrangement is provided in figure 4.
Private sector involvement	The Solomon Islands Meteorological Service (SIMS) is the primary organisation of relevance to the operation and maintenance of GBON stations in Solomon Islands. As detailed below, it maintains almost all the weather stations in Solomon Islands, manages almost all the weather data, and has a legislated mandate to do this. Water resources and hydrology in the Solomon Islands are managed by the Water Resources Management Division (WRMD) of the Ministry of Mines. The WRMD undertakes river and rainfall monitoring and operates a series of hydrometric stations. However these record only one GBON variable, rainfall, and do not generally report in real-time. In addition, due to loss of key staff from attribution and retirement, the capability of the WRMD in weather monitoring was limited at the time of the country visit. For these reasons, the WRMD has not been considered to play a key role in the GBON plan for Solomon Islands. The only other organisation presently operating weather stations in Solomon Islands is the Civil Aviation Authority of Solomon Islands (CAASI). It maintains three automatic weather observing systems (AWOS) at key airports including Henderson (Honiara), Kira Kira and Munda. (Figure 4). The Munda AWOS was not operational as of the date

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	of the country visit for the SOFF program due to maintenance challenges. The aviation AWOS do not provide data to SIMS systems. As SIMS does not have operational control nor ownership of these stations, it is difficult for SIMS to ensure the reliability and quality of these data. Consequently, this plan assumes that the GBON requirements will be met with alternative infrastructure owned and operated by SIMS. Private sector involvement in the SOFF Investment and Compliance Phases will include supply of equipment, consumables and construction of the AWS, manual and upper air stations. The private sector will be consulted at the commencement of the SOFF Investment phase to map out their role not just as suppliers of required supplies and services but as users of products to be generated by SOFF investment phase. The high level dialogue will advocate and explore possibilities for the establishment of long- term public- private partnership model for observations network in Solomon Islands.
Civil society participation	SIMS and UNDP have existing relationships with CSOs and the Private Sector and will continue to build on such mechanisms to support the delivery of the SOFF Investment Program, especially at the community level. Initial Stakeholder workshops and consultations will create awareness and seek ownership of the relevant public and private entities on SOFF. Partnerships will be further strengthened with Civil Society Organizations to extend the coverage of SOFF across the 9 provinces and targeted communities. Members of the Australian Humanitarian Partnership have an ongoing relationship with SIMS which will be maintained. Save the Children Australia through its GCF project will also be consulted to support areas not covered under SOFF.
Fiduciary systems	UNDP's Enterprise Risk Management (ERM) System is designed to allow the organization to be forward-looking and manage the effect of uncertainties on objectives. The ultimate purpose of ERM is to ensure foresight and risk-informed decisions across all levels of the organization, thereby maximizing gains while avoiding unnecessary losses. The ERM covers institutional, programmatic and contextual risks. The UNDP accountability system is guided by the Accountability Framework and Oversite Policy. The Internal Control Framework Policy defines the purpose and objectives of internal control and outlines how UNDP utilizes industry best practices to design, apply and continuously enhance internal control to achieve the organizational objectives. An anti-

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	fraud policy defines how UNDP mitigate and manages fraudulent and corrupt practices. The Direct Implementation Model proposed for the delivery of SOFF will allow UNDP to fully utilize its Internal Control Framework to deliver the activities and use resources efficiently and appropriately throughout the implementation period while working with MECDM and SIMS to transfer project management functions to the ministry to support the compliance phase of SOFF. Cost efficiency and effectiveness in project management will be achieved through adherence to the UNDP Programme and Operations Policies and Procedures (POPP). The SOFF initiative will be subjected to UNDP's corporate policies and Operations support will be provided by UNDP Solomon Islands to ensure compliance with the organization's Internet Control Framework. The relevant procurement policies and guidance documents will be used to facilitate the solicitation of GBON infrastructure and services. UNDP's Civil Works, ICT and Intellectual Services Policy will be used to inform the development of solicitation documents and management of relevant contracts.
Social and environmental safeguards	SOFF investments in Solomon Islands will adhere to the Environment Act 1989, Environment Regulations and the Environment Impact Assessment Guideline. At the project level at which SOFF will be implemented, the Social and Environmental Screening Procedure will be developed as part of the project formulation process to ensure the following: • Strengthen the quality of programming by ensuring a principled approach. • Maximize social and environmental opportunities and benefits. • Avoid adverse impacts on people and the environment. • Minimize, mitigate, and manage adverse impacts where avoidance is not possible. • Strengthen UNDP and partner capacities for managing social and environmental risks. • Ensure full and effective stakeholder engagement, including through a mechanism to respond to complaints from project-affected people. Environmental and sustainability considerations will be included in procurement process, as a selection criterion for suppliers. This will enable UNDP and SIMS to consider opportunities for reusable instruments or biodegradable products consumables, environmentally sustainable

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	packaging, ensuring instruments do not contain toxic substances such as mercury, and careful use of batteries to reduce toxic waste. As part of UNDPs Social and Environmental Safeguard's policy, an Environmental and Social Management Plan will be developed considering local conditions and approaches to minimize the environmental and social impacts of the construction activities. <u>Gender Action Plan</u> Guided by the Solomon Islands Gender Equality and Social Inclusion Policy (2022- 2024), a Gender Gap Analysis and Gender Action Plan will be developed to guide the mainstreaming of gender, disability and social inclusion (GEDSI) initiatives into SOFF investments as appropriately as possible. The Gender Action Plan will target: i) increased female participation in the roles associated with SOFF investment and Compliance Phase; ii) gender and disability inclusive designs to be incorporated in SOFF funded facilities; iii) inclusion of gender targets in procurement documents; and iv) development of ongoing campaigns in schools for roles linked to SIMS. All reports and publicity materials will ensure to capture GEDSI targets.
Dispute resolution mechanism	UNDP has standard Legal Context and Risk Management guidelines that are linked to the Standard Basic Assistance Agreement between the Government of Solomon Islands and UNDP signed on 4th April 1984 which highlights the Accountability Mechanisms. In terms of project management, the project board will be responsible for addressing any concerns of the stakeholders with regard to the project implementation of the SOFF initiative. The Environment Impact Assessment guidelines of Solomon Islands provide for public hearing on any major development that might alter the natural environment. SOFF Investments will be guided by this process for any disputes to be addressed. As much as possible, all SOFF investments will be undertaken on government land and property to avoid any issues. Where required, Memorandum of Understanding will be developed with relevant institutions for clear demarcation of responsibilities. All issues will be addressed appropriately to reach an amicable solution.
Additional relevant policies and procedures	The SOFF initiative entails a mixture of civil works, specialised services, ICT hardware and software which will be guided by UNDP's Construction Works Policy and Guidance notes. UNDP Procurement policies will guide

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	the solicitation and contract management of specialized services and construction. National laws and regulations in relation to construction, procurement, taxes, environment, waste management and occupational health and safety will be observed. These laws and regulations show no major constrains to the implementation of SOFF Investment Phase.

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6. Investment Phase Monitoring and Reporting

The implementing entity, with the support of the peer advisor, is expected to monitor the implementation of the Investment Phase following an output-based approach. The Investment Phase outputs as well as respective indicators and targets are presented below. *Please indicate the implementation targets and adjust the table as needed to reflect the implementation timeline. Years can be added.*

Output 1. GBON institutional and human capacity developed	Indicator	Target Y1	Target Y2	Target Y3	Target Y4	Target Y5
1.1 **National consultations** including with CSOs, and other relevant stakeholders conducted. 1.1.1. Inception workshop at the national and sub-national level targeting different stakeholders including CSOs and the private sector. 1.1.2. Stakeholders' engagement workshop on SOFF deliverables and identification of areas for collaboration. 1.1.3. High level engagement with relevant government institutions sustainability of GBON infrastructure.	# of consultation workshops % of female participants attendance in each workshop # of high-level dialogue conducted Implementation Plan in place	2 National Consultations 2 Provincial Consultations 30% female participation 1 Implementation Plan in Place	2 Provincial Consultations 30% female participation Annual Review of implementation plan	30% female participation Revisit targeted provinces Annual Review of Plan	30% female participation Revisit targeted provinces Annual Review of Plan	30% female participation Revisit targeted provinces Annual Review of Plan
1.2 NMHS institutional capacity required to operate the GBON network developed 1.2.1. Strengthen existing institutional arrangements to maximize SOFF initiatives and leverage existing regional initiatives. 1.2.2. Development of Gender Gap Analysis and Gender Action Plan for mainstreaming Gender aspects into SOFF. 1.2.3. Partnership strengthening with CSOs and Private Sector on SOFF initiatives. 1.2.4. Develop MoUs with relevant stakeholders	# of new/ updated processes # of established agreements Gender Analysis and Action Plan years of regional collaboration	UNDP/SIMS Grant Agreement in place Consolidated Procurement plan in place	Governance Arrangements in place. Gender Action Plan & Strategy In place.	Sub- regional agreements in place		

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1.2.5. Participation at regional coordination platforms on SOFF		Contribution to regional SOFF coordination	1 Regional coordination meeting	1 Regional Coordination	1 Regional Coordination meeting	1 Regional Coordination meeting
1.3 NMHS human capacity required to operate the GBON network developed 1.3.1. Training of existing SIMS Staff on operations of new equipment including BIP- MT Training, ICT & Comms training. 1.3.2. Recruitment of new staff and internship program for SIMS. 1.3.3. Staff participation in exchange programs with Peer Advisor and other SIDS NMHS participating in SOFF.	% increase of female staff # of staff trained # of specialized staff trained	10 staff trained. 5 trainee staff onboard 2 specialized training	10 of Staff trained in basic & comprehensive upper air maintenance 2 specialized training	SIMS technical & engineering staff trained in cellular & satellite configuration.		
Output 2. GBON infrastructure in place	**Indicator**	**Target Y1**	**Target Y2**	**Target Y3**		
2.1 **New land-based** stations and related equipment, ICT systems, data management systems and standard operating practices in place						
2.2 **Improved land-based** stations and related equipment, ICT systems, data management systems and standard operating practices in place 2.2.1. Secure land access for reopening of Kira Kira & new station at Tulagi 2.2.2. Undertake audit of existing manual equipment and facilities at staffed stations to identify all items for procurement.	# stations upgraded to GBON standards and sharing data internationally	4 manned stations 4 AWS Stations 1 Manual Station	3 manned stations 4 AWS Stations			

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2.2.3. Procurement of parts and installation for upgrading of existing manual equipment. 2.2.4. Procure AWS to co- locate with manned stations.						
2.3 **New upper-air** stations and related equipment, ICT systems, data management systems and standard operating practices in place 2.3.1. Secure land for upper air stations in Lata, Tulagi and Taro 2.3.2. Engagement of competent commercial firms/ entities for design, Geotech & environment impact assessment. 2.3.3. Engagement of competent commercial firms/ entities for construction of facilities 2.3.4 Engagement of competent commercial firms/ entities for supply of upper air consumables and communication systems 2.3.4 Improved upper air stations ICT systems, data management systems and standard operating procedures in place.	# of new GBON-compliant upper air stations constructed and operating and internationally sharing data	Tulagi Upper Air Station	Lata Upper Air Station	Taro Upper Air Station		
Outcome: Sustained compliance with GBON	**Indicator**	**Target Y1**	**Target Y2**	**Target Y3**		
3.1 **GBON land-based stations'** commissioning period[3] completed, country-specific standard cost for operations and maintenance established, and data sharing verified by WMO Technical Authority	# land- based stations commissioned.			8 Stations	8 Stations	8 Stations
3.2 **GBON upper air stations'** commissioning period completed, country-specific standard cost for operations and maintenance established, and data sharing verified by WMO Technical Authority	# upper air stations commissioned		Tulagi Upper Station Commissioned	Lata & Taro Upper Stations Commissioned	3 stations	3 Stations

[3] The commissioning period is the last year of the Investment Phase. The beneficiary country, supported by the Implementing Entity, must demonstrate the sustained operation of all the SOFF-supported stations according to the GBON compliance.

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The implementing entity is expected to report on progress as described below.

- **Quarterly updates** to the SOFF Secretariat: A simple standardized form providing a progress update against the Investment Phase Outputs' indicators (and Outcome, where applicable[4]) and flagging major issues that are delaying implementation, if any.
- **Annual narrative and financial reports** according to the UNMPTF reporting requirements indicated in the legal agreements. The annual narrative report reports on progress on the delivery of the Investment Phase Outputs, measured by the Investment Phase Indicators. It includes also a review of the Investment Phase risks and an update on environmental and social safeguards, including gender.
- **Final narrative and financial reports** according to the UNMPTF reporting requirements indicated in the legal agreements. The final narrative report confirms the completion of all the activities and report on the number of stations that have completed the commissioning period (outcome). The WMO technical authority verifies GBON compliance of the indicated stations and provides a verification report to the SOFF Secretariat. Upon WMO verification, the Investment Phase can be considered completed. The Final Report should describe the Investment Phase results achieved and lessons learned; and it should also specify the long-term institutional arrangements to secure sustained GBON compliance with SOFF Compliance Phase support.

[4] The quarterly reports should also include, when applicable, progress achieved in terms of new or rehabilitated stations that have become operational and are already sharing the data into the WIS 2.0 system as confirmed through the WIGOS Data Quality Monitoring System (WDQMS) web tool.

DocuSign Envelope ID: B36D93F9-1AA2-48B5-937A-67E89D31044C

7. Investment Phase Risk Management Framework

The Investment Phase Risk Management Framework should be based on the SOFF Risk Management Framework, incorporating relevant programmatic risks and including additional country-specific risks. Please follow the methodology established by the Multi-Partner Trust Fund Office (MPTFO) presented below.

		Impact				
		Insignificant (1)	**Minor (2)**	**Moderate (3)**	**Major (4)**	**Extreme (5)**
Likelihood	**Very Likely (5)**	Medium (5)	High (10)	High (15)	Very High (20)	Very High (25)
	Likely (4)	Medium (4)	Medium (8)	High (12)	High (16)	Very High (20)
	Possible (3)	Low (3)	Medium (6)	High (9)	High (12)	High (15)
	Unlikely (2)	Low (2)	Low (4)	Medium (6)	Medium (8)	High (10)
	Rare (1)	Low (1)	Low (2)	Medium (3)	Medium (4)	High (5)

Please complete the following table.

Risk	Risk level	Likelihood	Impact	Risk Mitigation Measures
Non-compliance with fiduciary and procurement standards in some SOFF activities	*Low*	*Unlikely*	*Minor*	*All relevant policies will be strictly adhered to*
SOFF-funded investments cause environmental or social impacts	High	Likely	Moderate	Environment and Social Impact Assessment will be undertaken for each site to inform mitigation plans.
NMHS staff depart after being trained	Medium	Unlikely	Major	Develop training plan for SIMS staff and invest in training multiple staff in specialized areas to minimize impact of

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				loss of experienced staff.
Slow implementation and delays in procurement, installation and capacity building activities	High	Likely	Moderate	Recruitment of experienced procurement staff and frontloading complex procurements within the first 18 months of implementation to ensure completion of GBON Infrastructure as per schedule.
After the conclusion of the Investment phase, GBON data are not collected or shared or are shared of insufficient quality	Low	Unlikely	Minor	Easy wins will be used as a pilot to identify and rectify data flow issues. Staff capacity, SOPS and resources will be put in place to ensure consistent data flows.
Destruction or theft of SOFF-financed equipment and infrastructure	High	Likely	Moderate	Locations of equipment will be secured by placing them with staffed stations for security and maintenance. Structural designs for Upper Air stations will factor in risks associated with natural hazards in the design process. Risk assessment specific for construction of AWS will be carried out as pre- requisite activities.
Countries cannot make optimal use of data, including accessing or using improved forecasts products from the Global	Medium	Unlikely	Moderate	Well-developed data management system, good institutional arrangement on use of data with key

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Producing Centers throughout the hydromet value chain				stakeholders, trained staff will be prioritized during the first 3 years of implementation to avoid issues of low data usage.
Lack equipment maintenance due to lack of spare parts leads to malfunctioning	Medium	Unlikely	Moderate	Procurement of equipment under the build and support contract including continuous proactive supply of spares with monthly inventory reporting.
Unreliable power leads to communication outage and data delay	High	Likely	Moderate	Equip all stations with backup power supply preferably solar energy.
Insufficient human resources or technical skills to install or maintain stations	Low	Unlikely	Minor	SOFF to provide support for training of technical staff during Investment and Compliance phase.

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Annex 1: National Gap Analysis

The National Gap Analysis undertaken by the Bureau of Meteorology Australia is attached as annex 1 of this document.

DocuSign Envelope ID: B36D93F9-1AA2-48B5-937A-67E89D31044C

Annex 2: National Contribution Plan

The GBON National Contribution Plan developed based on the National Gap Analysis undertaken by the Bureau of Meteorology Australia is attached as annex 2 of this document.

DocuSign Envelope ID: B36D93F9-1AA2-48B5-937A-67E89D31044C

Annex 3: Country Hydromet Diagnostics

The Solomon Islands Country Hydromet Diagnostics Peer Review Report is attached as annex 3 of this document.

DocuSign Envelope ID: B36D93F9-1AA2-48B5-937A-67E89D31044C

Annex 4: Terms of Reference for the provision of technical advisory services during the SOFF Investment Phase

1. Purpose and scope

These Terms of Reference describe the provision of technical advisory services by Bureau of Meteorology Australia to Solomon Islands Meteorological Services to contribute to the delivery of the SOFF Investment Phase outputs as described in Section 3.

The Terms of Reference are based on the SOFF Operational Manual, Section 4.4.3 on the Operational Partners and Section 4.5.2 on the Investment Phase; as well as on the SOFF Investment Framework, Section 4.5 on the Peer Advisors and WMO Technical Authority.

2. Roles and responsibilities

Beneficiary country National Meteorological and Hydrological Service

- Is responsible for implementing the activities of the SOFF Investment Phase activities with the support of the Implementing Entity and the peer advisor.
- Submits the SOFF Investment Phase funding request using the standardized template provided by the SOFF Secretariat, including the Terms of References for the peer advisor's technical advisory services during the Investment Phase.
- Is responsible for collaborating with the Implementing Entity to provide all the necessary information, participate in and facilitate the national activities that the Implementing Entity and peer advisor need to conduct in order to deliver the SOFF Investment Phase outputs.
- Confirms the completion of all the Investment Phase activities and provides comments as needed on the final report prepared by the Implementing Entity.

Peer advisor

- Is accountable to the beneficiary country and the Implementing Entity.
- Is contracted via the WMO pass-through mechanism and operates on a cost-recovery basis.
- Provides technical advisory services to support beneficiary countries and Implementing Entities in the design and implementation of the SOFF Investment Phase activities.
- Contributes to the final report of the SOFF Investment Phase.

Implementing Entity

- Prepares the Investment Phase funding request in collaboration with the beneficiary country and the peer advisor, including the Terms of References for the provision of technical advisory services during the SOFF Investment Phase.
- Manages the Investment Phase activities following the terms specified in the funding request and in collaboration with relevant national partners, including civil society organizations.

DocuSign Envelope ID: B36D93F9-1AA2-48B5-937A-67E89D31044C

- Delivers the Investment phase outputs and is responsible for their quality and timely delivery, in coordination with the country and the peer advisor.
- Provides quarterly updates to the SOFF Secretariat according to a simple standardized form and annual reports according to the United Nations Multi-Partner Trust Fund Office's reporting requirements indicated in the legal agreements.
- Informs the SOFF Secretariat of circumstances that could materially impede the implementation of the Investment phase or any considerable deviation in the conditions of the funding request to achieve its objectives.
- Submits the final report to the SOFF Secretariat including the beneficiary country's comments and the peer advisors' feedback. The final report describes the institutional arrangements to secure sustained operation and maintenance of the investments made.

WMO Technical Authority

- Provides basic on-demand technical assistance to the beneficiary country, Implementing Entity and peer advisor on GBON regulations, including on monitoring and assessing the data-sharing status of the stations using the WDQMS web tool[5]
- Is responsible for the verification of data sharing of the new or rehabilitated surface and upper -air stations as per GBON regulations.
- WMO provides a verification report to the SOFF Secretariat, upon which the Investment Phase can be considered completed.
- Establishes and administers the pass-through mechanism for contracting and funding of the advisory services provided by the peer advisors.

SOFF Secretariat

- Facilitates communication, coordination and collaboration between the beneficiary country, the Implementing Entity, the peer advisor and WMO Technical Authority.
- Reviews the SOFF Investment Phase funding request, including the Terms of Reference for the provision of technical advisory services and provides feedback as needed. Then transmits the funding request to the SOFF Steering Committee for their decision.
- Compiles quarterly updates and annual reports and monitors implementation based on information received from the Implementing entity, the peer advisor and the beneficiary country. Regularly informs the Steering Committee of progress.
- Coordinates regional implementation approaches to the SOFF Investment Phase.
- Confirms receipt of the final report by the Implementing Entity and completion of the Investment Phase based on WMO verification of data sharing.
- Organizes exchange of knowledge and experiences and captures lessons learned.

[5] The WDQMS web tool monitors the availability and quality of observational data based on near -real-time information from the four participating global Numerical Weather Prediction centres: the German Weather Service (DWD), the European Centre for Medium range Weather Forecasts (ECMWF), the Japan Meteorological Agency (JMA) and the United States National Centers for Environmental Pre diction (NCEP). These are four of the ten World Meteorological Centres, designated by WMO to provide global numerical weather prediction products for all WMO Members.

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3. Peer advisors' activities during the SOFF Investment Phase

The peer advisor, the Bureau of Meteorology (Bureau), will provide the following advisory services to Solomon Islands Meteorological Services (SIMS) during the SOFF Investment Phase:

- On-call advice and technical support – The Bureau will facilitate access to subject matter experts (SME) within its organisation to be available for on-call consultation, advice and support to SIMS via telephone or videoconference. This could include topics such as:
  - Station siting and exposure assessment
  - Equipment or communications issues
  - Quality management
  - WIS2.0 configuration and setup
  - WIGOS, OSCAR/Surface metadata setup and configuration
  - Suggestions for suppliers of equipment and services
  - Assistance with budgeting for operation and maintenance of stations during compliance phase

The fee in this Investment Proposal amount allows for up to 40 hours of Bureau SME consultation per year. Should further support be required, this would need to be requested as additional financing and would require approval.

- Regional engagement support – The Bureau will assist SIMS to connect with other met services, regional bodies and other hydromet initiatives in the region. This could include activities such facilitating introductions and multi-party discussions.

- Periodic peer reviews – The Bureau will undertake annual in-country peer reviews of progress during the Investment Phase and will contribute to the annual progress reports as well as the mid- term review and terminal evaluation of the project by UNDP. Each review will include a short assessment report and recommendations for adjustments to the Investment Phase approach if required. The regular reviews will aim to identify and head off any emerging problems or issues to avoid waste or investment funds or delays to the investment program.

The peer advisor may also undertake or have some involvement in some of the activities listed under Outputs 1 and 2 above, particularly relating capacity-building (e.g. BIP-MT training). However, this would done through a transparent procurement process and covered under the budget allowed for these Outputs by the Implementing Entity.